Density:

Review Density Asphalt Nuclear QC

Objectives

Asphalt Nuclear QC Overview

Familiarization with data entry and display windows

Enter an Asphalt Nuclear QC Lot

Retrieve/Review an Existing Asphalt Nuclear QC Lot

Edit Existing Asphalt Nuclear QC Lot

Delete an Existing Asphalt Nuclear QC Lot Test Section

About Asphalt Nuclear QC Density

In the process of placing asphalt at a job site, it is the contractor's responsibility to perform QC according to the state's HMA/QMS QA/QC program. One of these responsibilities involves performing nuclear density tests on asphalt placed. The results of these tests are recorded by the contractor's personnel on an M&T 516QC form and provided to the state's project inspector. The project inspector uses these in the QA/QC process and provides the forms to the RE's office for record keeping.

This portion of the densities module will provide that same functionality in HiCAMS. The RE office personnel will take the test results from the M&T 516QC form and enter them into the window provided (see below for screen shot and field descriptions). HiCAMS will then review the results for the lot and determine if the lot passed (based on the minimum compaction requirement for the JMF). If the lot failed, the RE will be notified.

Overview

The QC Asphalt Nuclear Density module of HiCAMS provides tracking and logging of QC asphalt nuclear density test results in a centralized location. It also assists the RE office personnel with identifying failing lots based on the HMA/QMS density specifications. This functionality includes, but is not limited to:

- Logging of all QC asphalt nuclear density test results for a project

- Identification of failing QC asphalt nuclear density test lots

- Notification to selected personnel of failing lots

Authorized Users

The staff members who will have the ability to create, verify and update QC Asphalt Nuclear Density records are:

- RE Office Personnel

The staff members who will have the ability to view QC Asphalt Nuclear Density records are:

- All staff

Window Descriptions

This is the window used for entering and reviewing asphalt nuclear QC density data:

Review Density Asphalt Nuclear QC (Header and Test Section Tab Navigation)

Fields

The following information will be displayed in the top section of the Lot tab, as a result of information entered for each lot in the lower portion of the tab:

- **Contractor:** Contractor firm name for the selected contract. Provided by HiCAMS.

- **Work Order:** The primary work order number for the selected contract number. Provided by HiCAMS.

- **Status:** Current status of the contract.

- **Test Date:** Date material was tested.   Entered by user. REQUIRED.

- **JMF:** The Job Mix Formula number for the sample. Entered by user or selected from the JMF Selection window when the selection icon is clicked. REQUIRED.

- **Material:** A list of asphalt materials available on the contract selected.

- "**Retrieve" (button):** When pressed, the test sections for the entered contract, date placed, JMF, lot number and control strip been entered will be retrieved and displayed.

- **Lot:** Lot number for this contract for this JMF on the given Test Date. Provided by HiCAMS.

- **Lot Construction**: Either "New" or "Other" as entered by user.

- **Map:** Map/Route Number as entered by user.

- **Control Strip:** Control strip as entered by user.

- **Core Sample Average:** Entered by user.

- **Average of 10 Readings:** Entered by user.

- **Target Density:** Calculated by HiCAMS.

- **Lot Average:** The average of the lot, based upon the samples entered in the results tab. Only those tests with the "**Incl. in Avg.**" checkbox (on the Results tab) checked will be included.

- **Lot Status:** Assigned by HiCAMS depending upon the minimum % compaction of the associated JMF:

  - *Meets Specs* – If the lot average is greater than or equal to the minimum % compaction for the JMF.

  - *Does Not Meet Specs-Pay Adjustment* – If the lot average is less than the minimum % compaction for the JMF.

Note: *When a failing lot is saved, a warning message will display ensuring that all tests have been entered for the lot. If Yes, a notification will be sent to the RE and Pavement Construction Specialist. If No, the lot cannot be saved.*

- **Lot Completed:** Provided by HiCAMS, the field will display an "Open" status, until completed by the user.

The following are fields in the lower section of the **Lot** tab, as entered by the user when starting a new lot:

Note: *If an existing lot is selected in the top section of the window, all applicable fields for that lot will be displayed in the lower portion of the window, containing results as entered previously by a user.*

- **Contract:** The HiCAMS contract number entered by user.

- **Contract Line Item:** Using the drop down list, select the valid line item based upon the material contained in the selected JMF, and the CBOM.

- **Test Date:** The date the tests for the lot were taken, as entered by the user.

- **JMF:** Provided by HiCAMS based upon date entered by user on the lot selected in the top portion of the window.

- **JMF Min. % Comp.:** Provided by HiCAMS based upon the JMF selected in the top portion of the window.

- **Lot:** Lot number for this contract for this JMF on the given date tested as originally entered by the user.

- **Lot Construction** (radio buttons): Will indicate status as entered by user when entering.

- **Material:** (aka Mix Type). The description of the material (aka mix type) used in the JMF for the line where the user's cursor is currently located. This field is updated each time the user moves to a line with a different sample. It is based on the JMF and if no JMF has been entered, it will be blank. Provided by HiCAMS.

- **Approved Producer:** The name of the producer of the JMF for the line where the user's cursor is currently located. This field also includes the plant at which the JMF was produced. This field is updated each time the user moves to a line with a different sample. It is

based on the JMF and if no JMF has been entered, it will be blank. Provided by HiCAMS.

- **Paving Contractor:** Using the Vendor icon, select the contractor from the **Contractor Selection** window**.**

Note: *Based upon the Test Type, certain Lots cannot be completed by RE Staff. Substitution tests can be entered, but must be marked "Completed" by a Pavement Construction Specialist.*

- **Lot Completed:** Provided by HiCAMS, the field will display an "Open" status, until completed by the user.

- **Map:** Enter the Map/Route Number.

- **NDT Name:** The Nuclear Density Technician's HiCAMS certification number. If this number is not known, the user can click on the staff icon and select a Technician by name through the Technician Selection Window. REQUIRED.

- **Lot Average:** The average of the lot, based upon the samples entered in the results tab. Only those tests with the "**Incl. in Avg.**" checkbox (on the Results tab) checked will be included in this average.

- **Lot Status:** Assigned by HiCAMS depending upon the minimum % compaction of the associated JMF:

  - *Meets Specs* – If the lot average is greater than or equal to the minimum % compaction for the JMF.

  - *Does Not Meet Specs-Pay Adjustment* – If the lot average is less than the minimum % compaction for the JMF.

Note: *A "generic" technician has been provided for selection in the event that the actual technician performing the test does not possess a valid certification. A comment is required when this technician is selected, and a notification is sent to the Pavement Construction Section.*

- **Control Strip:** Enter the control strip number.

- **Core Sample Average:** Enter the average of three core sample test results.

- **Average of 10 Readings:** Enter the average of 10 gauge readings.

- **Target Density:** Calculated by HiCAMS. (Control Strip/Core Sample Average).

- **PAR** (button): If the lot fails, a Pay Adjustment Recommendation can be initiated using this button.

- **Void** (button): Once a lot has been completed, it cannot be deleted. Use this button to void the lot and enter the test results again, if desired.

Note: *A failing lot that has been completed can only be voided by the Pavement Construction staff.*

- **Comment:** The freeform text field is accessed via the icon only. The comment is related to a sample. The comment field will be protected and display the latest comment. A comment will be required if the sample number, sample type or compaction % is changed and the user attempts to save the record.

This is the window used for reviewing QC asphalt nuclear density history data:

Review Density Asphalt QC Nuclear (History Tab)

Fields: Lot (top section)

- **Action:**

    - *Create* – A new lot was entered

    - *Comment* – A comment was added to an existing sample

- **Action Date**: This is the date the action was performed in HiCAMS.

- **Status:** Displays the sample status resulting from the action performed.

- **Who:** The full name of the user performing the action.

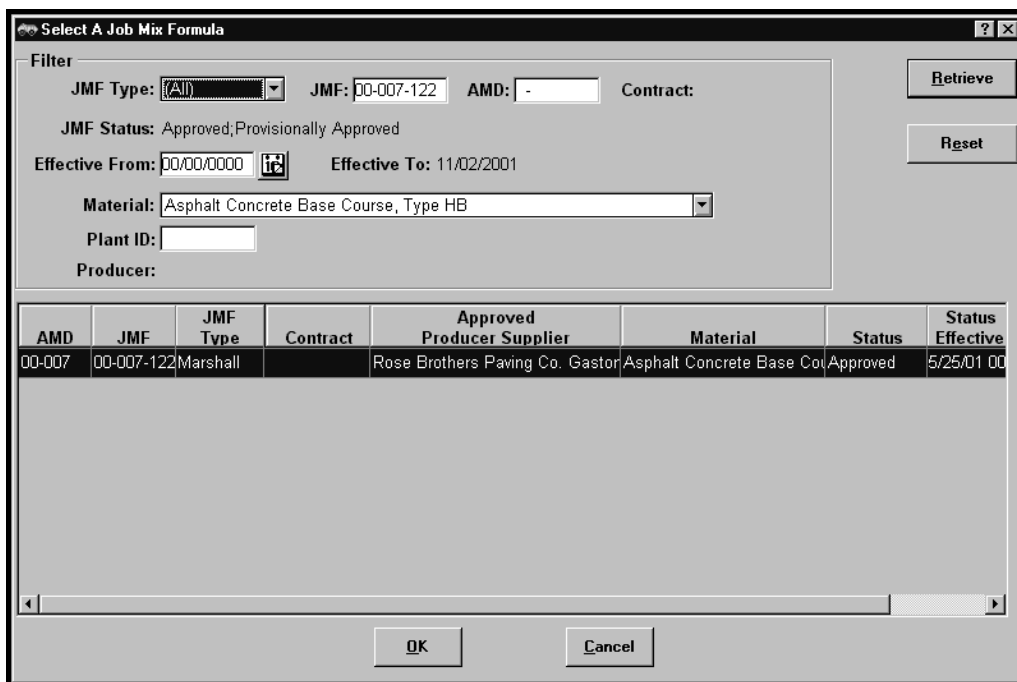- **Comment:** The comment associated to the selected history record.

Fields: Test Results (bottom section)

- **Action:** Indicates the action taken that caused the entry into the history:

    - *Create* – A new test was entered**.**

    - *Modify* – Data for an existing test was modified

    - *Comment* – A comment was added to an existing sample

    - *Delete* - A sample was deleted

- **Action Date:** This is the date the action was performed in HiCAMS.

- **Core:** The test number as entered.

- **Core Type:** The test type being updated.

- **Who:** The full name of the user performing the action.

- **Comment**: The comment associated to the selected history record.

Entering an Asphalt Nuclear QC Lot

Step 1: From the menubar, select **Functions® Density® Review Density Asphalt Nuclear QC**

Step 2: The **Review Density Asphalt Nuclear QC** entry window displays.

Step 3: Enter the **Contract.** If the contract you entered is not found in HiCAMS, the "Contract Selection Window" will be opened and you can select a Contract from this window. If you don't know the Contract to begin with, then click on the book button next to the Contract entry field.

Step 4: Enter the **Test Date** indicating the date the material was tested.

Step 5: Enter the **JMF.** If the JMF you entered is not found in HiCAMS, the "JMF Selection Window" will be opened and you can select a JMF from this window. If the JMF is unknown, click the button next to the JMF entry field; this displays the "JMF Selection Window":

Step 6:   Click on the **Retrieve** button. This will populate the contract and material information and if there are existing results, it will display them.

>   **Note:** *When the Retrieve button is pressed, if all data is valid, then the following fields will be populated by HiCAMS:*
>
>   • *Work Order*
>
>   • *Contractor*
>
>   • *Material*
>
>   • *Approved Producer*
>
>   • *JMF Min. % Comp.*
>
>   • *Lot Completed (defaults to "Open")*
>
>   *The remaining fields are left blank until populated either by the user or HiCAMS.*

Step 7:   To begin entering a new lot, click the **Insert** button from the task bar. A blank row will appear beneath the existing lots.

Step 8:   The **Lot** will default to 1. If this is not the first lot for this **Contract** and **Test Type,** HiCAMS will assign the next sequential lot number.

Step 9:   Select the **Contract Line Item** from the contract to which these tests are being applied. This is selected from the dropdown list box.

Step 10:   Select the **Paving Contractor** by using the **Contractor Selection** window.

Step 11:   Enter the **NDT Name** by entering the certification number of the technician that ran the QC tests. If this number is unknown, use the staff icon to display the **Technician Selection** window and select the technician.

>   **Note:** *Once you select or enter the NDT number, HiCAMS will retrieve the technician's name and display it in the NDT Name field.*

Step 12:   Enter the **Control Strip** number.

           According to the NCDOT Superpave Manual, control strips for a given contract must be numbered consecutively by

JMF, regardless of the plant that furnishes the mix. However, if a different plant produces a control strip of material, the suffix "A" would follow the number of that control strip. For example, Plant #1 control strips would be numbered 1, 2, 3. Plant #2 control strips would be numbered 4A, 5A, 6A,etc.

Each mix will have a separate series of control strip numbers. Recycled mixes are to be considered as a different mix as well, and entered into HiCAMS using a separate series of control strip numbers.

If a secondary gauge is used on a control strip for backup purposes, the secondary gauge control strip results will be entered using the same numbers as used for the primary gauge, with a suffix of "S".

Note: *If the Contractor has more than one paving operation on the same project, the control strip for the second operation will be entered by continuing the series of consecutive numbers, followed by the suffix "A"; if a third crew is used, the suffix "B" will be entered, etc.*

Step 13:   Enter the **Core Sample Average.**

Step 14:   Enter the **Avg. of 10 Readings**.

Note: *The Target Density will be calculated by HiCAMS (Control Strip /Core Sample Average).*

Step 15:   Enter any **Comment** that you may have about the lot. Do this by clicking on the comment icon and entering your comment in the window provided.

Step 16:   Next, enter the **Test Sections** for this Lot. Click the **Results** tab.

Note: *HiCAMS will default the checkbox to "checked" for the "Include In Avg." column. If a QC Check test is entered, this result will override the original QC test entered. Additionally, if a QC Substitution is entered, it will override the QC or QC Check with the same Test Section number:*

Lot	Results	History				
Include in Avg.	**Test Sect.**	**Test Type**	**Station From**	**Station Fraction**	**Location**	**Avg. % Comp.**
☑	25	QC	90 +	00	End 110+00	93.0
☑	26	QC	110 +	00	End 130+00	93.3
☑	27	QC	130 +	00	End 150+00 NBL RT	91.6
☐	28	QC	150 +	00	End 170+00	93.6
☑	28	Check QC	150 +	00	End 170+00	92.7

Step 17: Enter the **Test Section** number.

Step 18: Enter the **Test Type**. Select from:

- *Check QC*
- *QC*
- *Substitution QC*

Step 19: Enter station number of the first test taken in the test section in the **Station From** column for the test section.

Step 20: Enter the **Station Fraction**.

Step 21: Enter any other information such as other station numbers, offset, etc. in the **Location** column for the test section

Step 22: Enter average of the 5 nuclear compactions for the test section in the **Avg. % Comp.** column.

Repeat **Steps 17**-**22** to enter any additional test sections for this lot.

Step 23: **Save** the data you entered by clicking on the save icon. 🖫

Note: *A message will display prompting you to either complete the lot, or leave it open for further test section entry.*

On failing lots, you may recommend a **Pay Adjustment**:

Step 24:   Click the **PAR** button on the Lot tab. The **Pay Adjustment Recommendation** window will display:

Step 25:   Complete the *Description, Quantity,* and *Percent* fields.

Step 26:   Select the *Reason* from the drop down menu.

Step 27:   Click **Save**. The **Forward** button will now be enabled, to forward to the appropriate person for approval:

Step 28: Click **Forward** button. A Staff List window will display to select the appropriate person to approve:

Step 29: Select the appropriate staff and forward.

Retrieve/review existing Asphalt Nuclear QC Lots

Follow **Steps 1-6** in the section above **Entering an Asphalt Nuclear QC Lot** section above.

All existing test sections for the selected lot will be displayed in the list on the lower portion of the window. Your cursor will be placed at the bottom of the list. You may scroll up or down to see any core sample you are interested in and you will see the results for that core:

Edit an existing Asphalt Nuclear QC Lot

Follow **Steps 1-6** in the section **Retrieve/Review an existing Asphalt Nuclear QC Lot** above**.**

Step 7:   Scroll up or down to find the test section you wish to modify.

Step 8:   Place your cursor in the field you wish to modify and make the change.

Step 9:   Repeat this for any field on the window.

Step 10:   **Save** the data you entered by clicking on the save icon. 💾

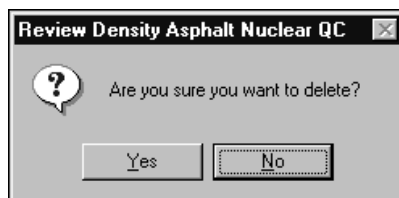# Delete an existing Asphalt Nuclear QC lot Test Section

Follow **Steps 1-6** in the section **Entering an existing Asphalt Nuclear QC Test Section** above.

Step 7:   Scroll up or down to find the test section you wish to delete.

Step 8:   Place your cursor anywhere on the line for the test section.

Step 9:   Click on the "Delete" icon.

Step 10:   You will be asked to confirm the deletion and enter a comment indicating why you are deleting the test section:

Step 11:   Delete other test sections as desired.

Step 12:   **Save** the data you entered by clicking on the save icon. 💾

Void an existing Nuclear QC Lot

Step 1:   Follow **Steps 1-6** in the section above **Entering an existing Nuclear QC Lot**.

Step 2:   Place your cursor on the line with the core you wish to void.

>   **Note:** *If the lot has been set to "Complete" and is in failing status, only the Pavement Construction staff can void it; therefore the button will be disabled.*

Step 3:   Click the **Void** button.

Step 4:   Void other Nuclear QC lots as desired.